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8

Developing Conclusions and Judgments of Need

Conclusions and judgments of need are key elements of the investigation that must be developed.

8.1 Conclusions

Conclusions are significant deductions derived from the investigation's analytical results. They are derived from and must be supported by the facts plus the results of testing and the various analyses conducted.

Conclusions may:

- Include concise statements of the causal factors of the accident determined by analysis of facts
- Be statements that alleviate potential confusion on issues that were originally suspected causes
- Address significant concerns arising out of the accident that are unsubstantiated or inconclusive

- Be used to highlight positive aspects of performance revealed during the investigation, where appropriate.

When developing conclusions, the board should:

- Organize conclusions sequentially, preferably in chronological order, or in logical sets (e.g., hardware, procedures, people, organizations)
- Base conclusions on the facts and the subsequent analysis of the facts
- Include only substantive conclusions that bear directly on the accident, and that reiterate significant facts and pertinent analytical results leading to the accident's causes
- Keep conclusions as short as possible and, to the extent possible, limit reference citations (if used) to one per conclusion.

EXAMPLE: CONCLUSIONS

- XYZ contractor failed to adequately implement a medical surveillance program, thereby allowing an individual with medical restrictions to work in violation of those restrictions. This was a contributing factor to the accident.
- Welds did not fail during the steam line rupture.
- Blood tests on the injured worker did not conclusively establish his blood alcohol content at the time of the accident.
- The implementation of comprehensive response procedures prevented the fire from spreading to areas containing dispersible radioactive materials, averting a significant escalation in the consequences of the fire.

TIP

The process of determining conclusions seeks to answer the questions — what happened and why did it happen?

8.2 Judgments of Need

Judgments of need are the managerial controls and safety measures determined by the board to be necessary to prevent or minimize the probability or severity of a recurrence. Judgments of need should be linked to causal factors and logically flow from the conclusions. They should be:

- Stated in a clear, concise, and direct manner
- Based on the facts/evidence
- Stated so that they can be the basis for corrective action plans.

Judgments of need:

- Should **not** be prescriptive corrective action plans or recommendations, nor should they suggest punitive actions
- Should **not** include process issues (e.g., evidence control, preservation of the accident scene, readiness) unless these issues have a direct impact on the accident. These concerns should be noted in a separate memorandum to the appointing official, with a copy to site management and the Assistant Secretary for Environment, Safety and Health.

An interactive process is the preferred approach for generating judgments of need.

That is, board members should work together to review causal factors and then begin generating a list of judgments of need. These judgments should be linked directly to causal factors, which are derived from facts and analyses.

TIP

Board members should work together to derive judgments of need to assure that the merits and validity of each are openly discussed and that each one flows from the facts and analyses.

One method for ensuring that all significant facts and analytical results are addressed in the judgments of need is to develop displays linking judgments of need with facts, analyses, and causal factors. Previous boards have found it useful to display these elements on the walls of the board's conference room. Figure 8-1 demonstrates how this information can be arranged to provide an ongoing assessment of linkages among the four elements. It portrays the concept of requirements verification analysis described in Section 9 of this workbook. Using this approach, the board can identify gaps in the data where a clear, logical flow among the four elements is missing. The board can use this information to determine whether judgments of need are supported by linkages connecting the facts, results from analyses, and causal factors.

TIP

If a judgment of need cannot be clearly linked to causal factors derived from analyses of facts, exclude it from the report.

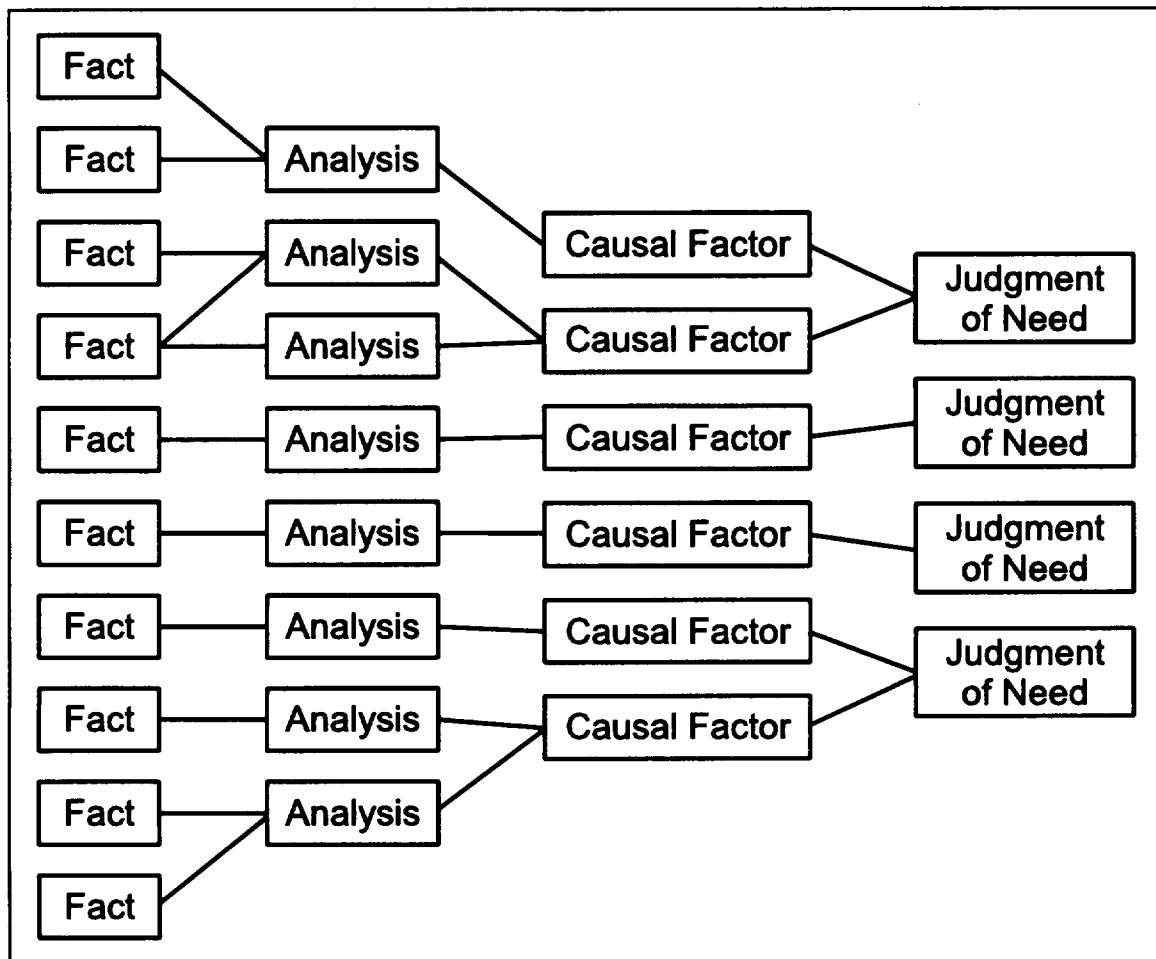


Figure 8-1. Facts, analyses, and causal factors are needed to support judgments of need.

Once the board has identified the judgments of need derived from their investigation activities, the members can begin writing statements documenting these judgments. Table 8-1 presents guidance on writing these statements.

Table 8-2 provides samples of well-written judgments of need for the case study electrical accident. Information in this table demonstrates the relationships among

significant facts, analysis, causal factors, and judgments of need.

Judgments of need form the basis for corrective action plans, which are the responsibility of line management and should not be directed by the board. If the board finds a need to make specific recommendations, they should appear in a separate communication and not in the body of the report or in the transmittal letter to the appointing official.

Table 8-1. These guidelines are useful for writing judgments of need.

Clearly identify organizations that need to implement actions to prevent recurrence of the accident. Where applicable, specify whether the judgment of need applies to a DOE Headquarters or field element, contractor, subcontractor, or some combination of these.
Avoid generic statements and focus on processes and systems, not individuals.
Focus on causal factors.
Be specific and concise; avoid vague, generalized, broad-brush, sweeping solutions introduced by "should."
Do not tell management how to do something; simply identify the need.
Present judgments of need in a manner that allows a specific organization to translate them into corrective actions sufficient to prevent recurrence.

Table 8-2. Case Study: Judgments of Need

Significant Facts	Causal Factors	Judgments of Need
Safety training for the accident victim as required by WS ES&H Manual Procedure 1234 was not completed prior to the accident.	Training implementation was informal and was not based on appropriate structured development and measurement of learning. This programmatic deficiency was a contributing cause to the accident.	WS management needs to evaluate the effectiveness of implementation of the training program by observing and measuring workplace performance.
The standing work order system normally used for nonroutine, nonrepetitive tasks was used to authorize the work involved in the accident.	Using the standing work order process, normally used for routine tasks, to accomplish nonroutine, complex modification and construction work was a root cause of the accident.	XYZ management needs to assure that the standing work order system is used only on routine, repetitive, and non-complex tasks where no significant risks or hazards have been identified or could reasonably be encountered.

8.3 Minority Opinions

During the process of identifying judgments of need, board members may find that they disagree on the interpretation of facts, analytical results, causal factors, conclusions, or judgments of need. This disagreement can occur because the board:

- Has too few facts or has conflicting information from different sources;

when this occurs, additional information may be needed to resolve these conflicts

- Needs to evaluate the analyses conducted and consider using different analytical techniques
- Disagrees on the linkages among facts, analyses and causal factors.

Even when new facts are collected and new analyses are conducted, board members may still strongly disagree on the interpretation of facts, the conclusions, or the judgments of

need. Board members should make these differences known to the chairperson as soon as they arise.

Every effort should be made to resolve a board member's dissenting opinion by collecting additional facts, if possible, and conducting additional analyses.

When board members still disagree, it is recommended that the chairperson:

- Obtain a detailed briefing from those not in agreement and consider the facts, analyses, causal factors, and conclusions that each used.
- Monitor the differences between those not in agreement by holding meetings to discuss any new information collected or new analyses conducted; more common ground may be found as this information emerges.
- Work with the board to identify areas of mutual agreement and areas of

disagreement as the end of the investigation approaches.

- Openly discuss his or her position concerning the causal factors, conclusions, and judgments of need with the board and achieve consensus. At this point, board members who disagree with the consensus should describe their position and indicate whether there is a need to present a minority opinion in the accident investigation report.

Note that the board is not required to reach consensus, but is encouraged to work diligently to resolve differences of opinion. However, if one or more board members disagree with the interpretation of facts, causal factors, conclusions, or judgments of need endorsed by the remainder of the board, the minority board member or members should document their differences in a minority report. This report is described in Section 9.

KEY POINTS TO REMEMBER

Conclusions are significant deductions derived from the investigation's analytical results. They are derived from and supported by the facts plus the results of testing and various analyses conducted.

- Judgments of need are the managerial controls and safety measures necessary to prevent or minimize the probability or severity of an accident's recurrence.
- To ensure that a clear and comprehensive list of judgments of need is presented, the board should link each judgment of need with causal factors, analyses, and facts. If the linkage is weak at any point, the judgment of need should be excluded from the list.
- As the board generates the judgments of need, differing opinions may emerge. If these differences cannot be resolved at the end of the investigation, the board member(s) whose opinion(s) differs from the majority should prepare a report describing those differences (i.e., the minority report). This circumstance generally arises as a result of: (1) insufficient or conflicting factual information, (2) inconclusive or conflicting analytical results, (3) disagreement as to the interpretation of facts, causal factors, conclusions, or judgments of need, or (4) unclear linkage among facts, analyses, and causal factors.